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Weekly Surveyor

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TSWS-5/75

3 February 1975

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WEEKLY SURVEYOR

USSR AND EASTERN EUROPE

A Soviet towed hydroacoustic array appears more sophisticated than previously suspected.

first Soviet marine mammalogist ever to attain such a high status. This action indicates the importance that marine mammal research is currently receiving in the USSR.

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In a Soviet isolation chamber experiment, vegetable crops were grown hydroponically. A 28 earth-day period, 14 days of light and 14 days of darkness, was selected to match the lunar light cycle. This is further evidence that the Soviets are interested in conducting manned lunar explorations.

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Bulgaria's Ministry of Agriculture is seeking US assistance in developing a 300,000-acre grain and meat agro-industrial complex (AIC). The AIC is an experiment which was inaugurated in 1970/71 under a Bulgarian program of reforms for agriculture and the food industry. Livestock and poultry operations, including the necessary grain production are combined with complete processing facilities for marketing meat, milk, eggs, and wool products. This huge AIC will integrate six smaller AICs over a 3-year period; there are now 170 AICs in Bulgaria. If successful, AICs may be introduced gradually in other Bloc countries.

Vladimir Yevgenyevich Sokolov, a prominent Soviet dolphin researcher, has been elected to the Academy of Sciences, USSR. He is the

Soviet research on NIEMR to produce controllable psychophysiological effects may

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have been prompted by the fomulation of a theory which treats the mechanism of biological action of several NIEMR signals. Limited US research into the effects of a single NIEMR field has provided evidence of low level psychophysiological effects on animals. Virtually no research has been performed using several combined NIEMR fields.

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The USSR is negotiating to buy US food technology for processing potatoes and making dry cereals. Such changes in food processing notwithstanding, the Soviets plan for the per capita consumption of potatoes and grain products to decrease. Instead the Soviets are interested in increasing the consumption of fruits, vegetables, and livestock products.

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The USSR makes extensive use of airplanes in agriculture, partly because of insufficient equipment for ground operations. The Soviets, however, have complained about uneven application of fertilizer

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This uneven distribution results in lower yields, uneven plant growth and uneven maturity of grain. The latter increases harvesting losses and lowers grain quality.

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CHINA

Some progress has been made throughout the PRC to expand the use of a common language

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(putunghua), to simplify characters of the writing system, and to teach a phonetic writing system (pinyin). Positive effects of these language reforms will affect the Chinese society only gradually and eventually would enable the regime to use national broadcasts for propaganda and population control.

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NUCLEAR ENERGY

Delivery Delays Are Affecting Soviet Construction of the Yerevan Nuclear Power Station: The unsatisfactory pace of construction at the Soviet nuclear power station (AES) at Yerevan, USSR, is due to the sporadic deliveries of construction materials, structures, and equipment. The Kurakhovo reinforced concrete structures plant has delivered less than half of the concrete wall panels required. The Baku repair and mechanical plant has failed to deliver 52 tons of special pipes for the circulating water circuit. Hundreds of tons of stainless steel and fittings have never been received. Only a quarter of the sand needed for construction has been delivered.

Equipment is slow in arriving and frequently is received in incomplete sets. Recently the station's first turbine was delivered but without the conditioners that go with it. With respect to pumping equipment, the delivery deadline for 6 units of assemblies and parts elapsed last year.

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OFFENSIVE SYSTEMS

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Soviets Investigate NIEMR to Produce Controllable Psycho-physiological Effects:

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[redacted] NIEMR research is being conducted at the Institute of Higher Nervous Activity imeni I. P. Pavlov, Leningrad. This research has resulted in the formulation of a theory for the induction of psychophysiological effects using several NIEMR signals. [redacted] the results of the research have encouraged the Soviets to investigate methods for exploiting the use of NIEMR to produce controllable psychophysiological effects, and that laboratory facilities for investigating the combined effects of several microwave frequencies have been built at various institutes.

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Comment: A valid theory for the induction of psychophysiological effects using several NIEMR signals could give the Soviets a capability to develop effective antipersonnel weapons. The previously reported psychophysiological applications research [redacted]

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[redacted] may have been prompted by the success obtained in testing this theory.

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Limited US research into the effects of a single NIEMR field, mostly using animals, has provided evidence of low level [redacted] psychophysiological effects. Virtually no comparable research has been performed, however, on the psychophysiological effects of several combined NIEMR fields.

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LIFE SCIENCES

Soviet Biological Life Support System Research Is for Manned Lunar Base: A recently translated article describes portions of a 1973 isolation chamber experiment in which three participants lived on hydroponically grown vegetable crops. The quick ripening, annual vegetable plants provided both food and atmospheric regulation. Crops were grown on a conveyor system, 7.5 square meters in total area, under alternating 14-day periods of light and 14-day periods of dark. This 28 earth-day period was selected to match the lunar light cycle.

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Comment: This report is one of several indications that the Soviets still are concerned with conducting manned lunar exploration. Also, this is the first direct indication that Soviet biological life support system research, which previously has emphasized only the interplanetary and earth orbital space applications, also is oriented toward lunar base support. Biological regenerative life support systems are competitive with physical/chemical systems in terms of weight, only on long term (greater than one year) space missions.

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Soviet Dolphin Researcher Elected to the Academy of Sciences, USSR: Vladimir Yevgenyevich Sokolov has been elected to the USSR Academy of Sciences.

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Comment: V. Ye Sokolov's election to the academy, the most prestigious and the most powerful scientific and technical council in the Soviet Union, indicates the importance that marine mammal research, particularly dolphin research is currently receiving in the Soviet Union. Sokolov is the leading Soviet marine mammal researcher as well as head of the Soviet Navy's classified dolphin research facility near Sevastopol. He is the first marine mammalogist ever to attain such a high status in the USSR.

Sokolov's elevation to academician and the recent large resource investment in the classified navy facility suggest that applied dolphin research is considered to be a highly important area.

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AGROTECHNOLOGY AND FOOD RESOURCES

Soviets Complain Aerial Application of Fertilizer Is Done Badly:
The First Secretary of Orel Oblast, USSR, reports there are frequent complaints that grain fields are unevenly fertilized by aircraft--heavily in some places and lightly in others. Almost one-third of all mineral fertilizers are now applied by aircraft. Aerial application has its advantages but the cost is substantially higher than spreading with ground equipment. The Secretary notes that the uneven application stems from fliers not being held responsible for the quality of their work. He suggests that the quality of aerial application would improve if payment to aircraft units was based on actual harvest produced on the treated grain fields.

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An uneven application of fertilizer results in lower yields, uneven plant growth and uneven maturity of grain. The latter increases harvesting losses and lowers grain quality. The USSR makes extensive use of airplanes in agriculture, partly because of insufficient equipment for ground operations. For example, practically all winter grains receive an aerial top dressing of nitrogen fertilizer.

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Soviets Price US Technology for Potato and Cereals Processing:
The USSR is negotiating to buy US food technology for processing potatoes and making dry cereals. In December 1974, a Soviet delegation visiting US food processors solicited a proposal whereby three US companies together would provide the engineering and needed equipment, train the required personnel, and manage the startup operations of a plant processing 100 thousand tons of raw potatoes per year. The Soviets would repay the US firms from the plant's production of an array of frozen and dehydrated potato products. Similarly, the Soviets asked for a preliminary proposal for obtaining US

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cereal processing technology covering wheat, corn and oat cereals. They expressed interest in US technology for textured soybean protein but stopped short of requesting a proposal.

25X1 Comment: Upgrading USSR food processing technology to include these new products would add sophistication to the USSR assortment of foods without requiring an increase in agricultural production.

Purchase of these plants, however, would be a small step toward the Soviet goal of increasing the range of available consumer products. Before such products can come into general production, the Soviets will need to institute major improvements in food packaging, storage, and distribution facilities.

25X1 The USSR grows about 100 million tons of potatoes per year, 35 percent of global output. Roughly, one-third is used for food; one-third for seed, starch and alcohol; and the remainder is fed to livestock, largely in the private sector of agriculture. Per capita consumption of potatoes is 2.1 times the US level of grain products, 2.3 times. While the methods of preparing (processing) potatoes and cereals for food will change, the Soviets plan for the per capita consumption of potatoes and grain products to decrease, leaving more for other uses. At the same time, the Soviets are interested in increasing the consumption of fruits, vegetables and livestock products.

Bulgarian Plans for a Model Agro-Industrial Complex Include US Agrotechnology: During December 1974 Dimitar Jurukov, Deputy Minister, Bulgarian Ministry of Agriculture met with representatives from a US firm to discuss a proposal for a 300,000-acre grain and meat agro-industrial complex (AIC) to be developed in the district of Silistra. A delegation from Silistra had traveled to the US in September to request the assistance of the US company and of university groups. US equipment and technology are needed primarily to mechanize and automate the processes for supporting an efficient, large-scale meat production and marketing operation. The complex is to be a model for the modernization of Bulgarian agriculture.

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Comment: This huge AIC will integrate six smaller AICs in the district of Silistra, over a 3-year period. The AIC is an experiment which was inaugurated in 1970/71 under a program of reforms for agriculture and the food industry.

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Basically, it is an organizational system which permits the same type of production units to be merged, such as state and cooperative farms, and also allows industrial enterprises to be added. In this case livestock and poultry operations, including the necessary grain production, are combined with complete processing facilities for marketing meat, milk, eggs, and wool products. There are now 170 AICs in Bulgaria covering some 90 percent of the country's arable land. If successful, AICs may be introduced gradually in other Bloc countries.

There are disadvantages to large-scale farming which must be considered in this experiment. For example, there is an optimum size for a cattle herd beyond which disease increases and fertility falls. There is also an optimum area (number and type) for agricultural machinery beyond which the machines are used inefficiently. Nevertheless, the AIC concept appears to be feasible for Bulgaria's outdated system of agriculture. With the aid of Western technology, particularly US, Bulgaria's prospects are good for more and better agricultural products in the near future.

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PHYSICAL SCIENCES AND TECHNOLOGIES

Chinese Language Revolution Continues: It has been reported that a great deal of progress has been made throughout China in expanding the use of "putunghua," a common language. Progress also has been made in simplifying characters of the writing system and in teaching "pinyin," a phonetic writing system. Putunghua is to replace the eight Chinese (Han) languages and is being taught to speakers of minority languages, though they are encouraged to maintain their native languages as well. The Chinese effort appears to be the most impressive example of language planning in the world today.

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Comment: Although progress is being made, the positive effects of these language reforms will affect the Chinese society only gradually. There are reports, for example, that the students in elementary schools are more proficient in putunghua than their teachers. There are no reported attempts to educate those past college age in putunghua. It will take at least a complete generation educated in putunghua for the full impact of language reform to be realized throughout the country.

The use of a common language, in time, could contribute significantly to the unity of the country. It will eventually enable the regime to use national broadcasts effectively for propaganda and population control. It also will facilitate interregional communications and travel. The simplification of characters in the writing system and the use of a phonetic writing system will lessen the burden on pupils and allow for both quantitative and qualitative improvements in education.

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Soviet Towed Hydroacoustic Array Appears More Sophisticated Than Previously Suspected: Soviet scientists recently have reported on a 600-meter, 12-channel towed hydroacoustic array for geophysical studies. The array is made up of 12 50-meter segments, one for each channel. Each segment contains 22 ferroelectric ceramic elements spaced uniformly over a 44-meter length. The elements' sensitivities are shaded toward the ends of the segment to reduce hydrodynamic flow-noise. The tube containing the elements is made of polyvinyl chloride and is 44 mm in diameter. A special multiconductor cable 300 meters long and an elastic shock cord are employed to reduce vibrations and decouple the array from the ship's vibrations. In the course of geophysical research, signals from the 12 channels

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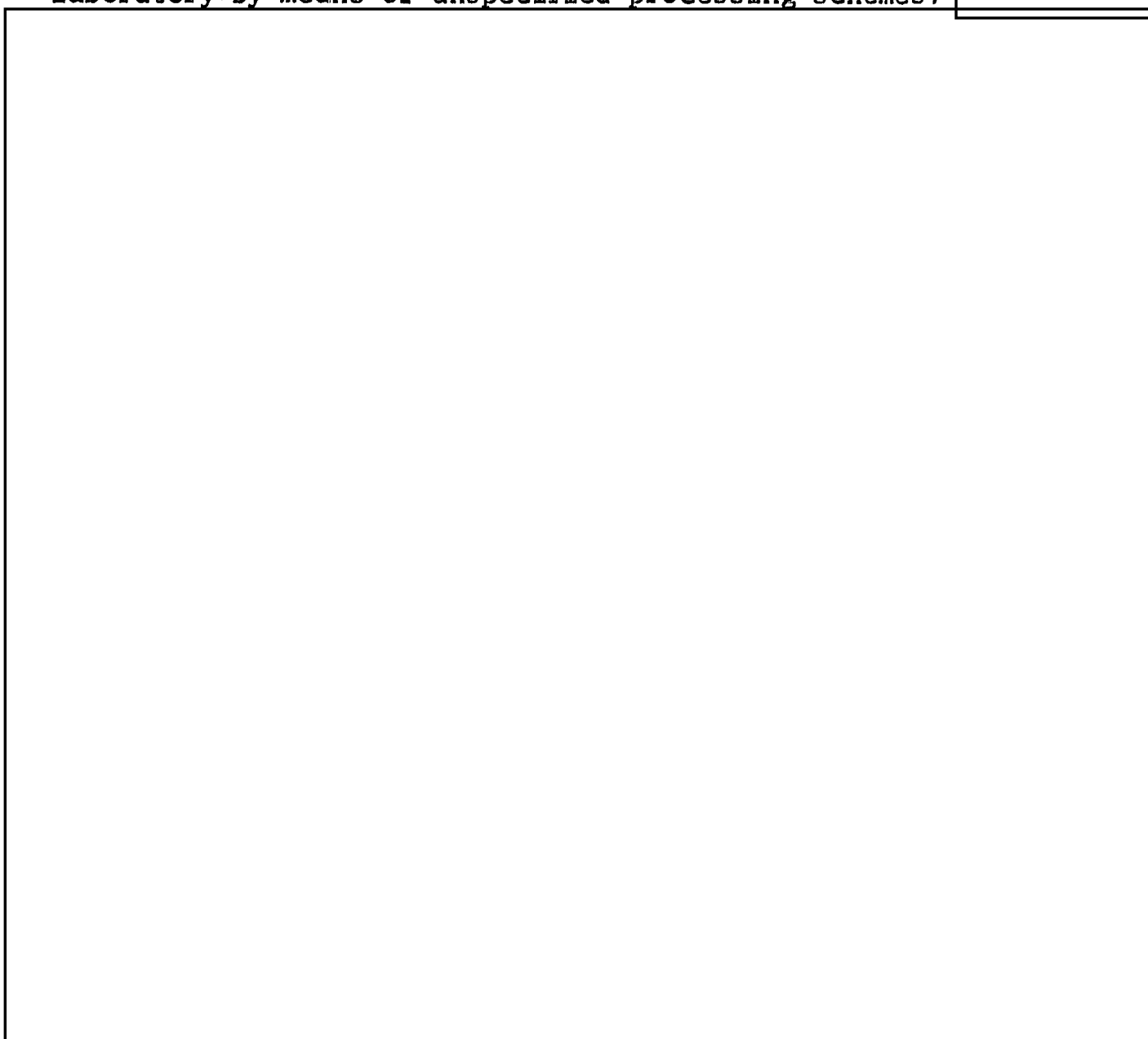
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are recorded on board the vessel and later reduced at an onshore laboratory by means of unspecified processing schemes. [REDACTED]

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